

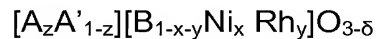
Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1 – 17 (cancelled)

Claim 18 (currently amended): ~~The composition according to Claim 16, A catalytic composition for partial oxidation of light hydrocarbon mixtures, comprising:~~

~~wherein said a perovskite crystallographic structure further comprises comprising a formula (I):~~



wherein said A and said A' each comprise at least one component selected from the group consisting of the ~~lanthanide~~ lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups of columns Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 < x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain the an electric neutrality of said perovskite compound.

Claim 19 (previously presented): The composition according to Claim 18, wherein said A and said A' each comprise at least one component selected from the group consisting of:

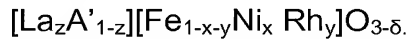
- i) La;
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 20 (previously presented): The composition according to Claim 19, wherein said A is La.

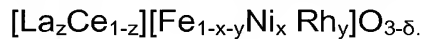
Claim 21 (previously presented): The composition according to Claim 18, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 22 (currently amended): The composition according to Claim 18, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ia):



Claim 23 (currently amended): The composition according to Claim 18, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ib):



Claim 24 (previously presented): The composition according to Claim 18, wherein $0 < x \leq 0.5$.

Claim 25 (previously presented): The composition according to Claim 18, wherein $0 < y \leq 0.25$.

Claim 26 (previously presented): The composition according to Claim 18, wherein $z < 1$.

Claim 27 (currently amended): The composition according to Claim 22, wherein said formula (Ia) comprises ~~about~~ $\text{La Fe}_{0.7}\text{Ni}_{0.25}\text{Rh}_{0.05}\text{O}_{3-\delta}$.

Claim 28 (currently amended): The composition according to Claim 23, wherein said formula (Ib) comprises ~~about~~ $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$.

Claim 29 (cancelled)

Claim 30 (currently amended): The composition according to Claim ~~[[16]]~~ 18, wherein said partial oxidation of light hydrocarbon mixtures occurs when an operating temperature of the catalyst is in the range of about 500 to about 1300 °C.

Claim 31 (previously presented): The composition according to Claim 30, wherein said operating temperature of the catalyst is in the range of about 600 to about 1100 °C.

Claim 32 (currently amended): The composition according to Claim ~~[[16]]~~ 18, wherein said partial oxidation of light hydrocarbon mixtures occurs when an operating pressure of the catalyst is in the range of about 10^5 Pa to about 3×10^6 Pa.

Claim 33 (previously presented): The composition according to Claim 32, wherein said operating pressure of the catalyst is in the range of about 10^5 Pa to about 10^6 Pa.

Claim 34 (currently amended): The composition according to Claim ~~[[16]]~~ 18, wherein said partial oxidation ~~further comprises~~ of light hydrocarbon mixtures occurs when at least one oxidant gaseous feed is combined with said light hydrocarbon mixtures, and wherein said oxidant gaseous feed is at least one selected from the group consisting of:

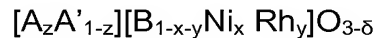
- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.

Claim 35 (currently amended): The composition according to Claim ~~[[16]]~~ 18, wherein said light hydrocarbon mixture to be partially oxidized further comprises natural gas.

Claim 36-38 (cancelled)

Claim 39 (currently amended): ~~The method according to Claim 37,~~ A method for making a catalytic composition for the partial oxidation of light hydrocarbon mixtures, comprising:

preparing an aqueous solution comprising a salt comprising A, a salt comprising A', a salt comprising B, a salt comprising Ni, and a salt comprising Rh;
combining said aqueous solution with an acid;
evaporating said aqueous solution to form a sol;
drying said sol to form a ~~wherein said~~ perovskite crystallographic structure ~~further comprises~~ comprising formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the ~~lanthanide~~ lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 < x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain ~~[[the]]~~ an electric neutrality of said perovskite compound.

Claim 40 (previously presented): The method according to Claim 39, wherein said A and said A' each comprise at least one component selected from the group consisting of:

i) La;

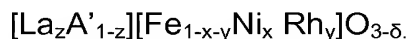
- ii) Ce;
- iii) Ca; and
- iv) Sr.

Claim 41 (previously presented): The method according to Claim 40, wherein said A is La.

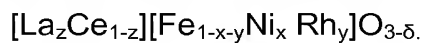
Claim 42 (previously presented): The method according to Claim 39, wherein said B is at least one component selected from the group consisting of:

- i) Mn;
- ii) Fe;
- iii) Co; and
- iv) Al.

Claim 43 (currently amended): The method according to Claim 39, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ia):



Claim 44 (currently amended): The method according to Claim 39, wherein said perovskite crystallographic structure ~~further~~ comprises formula (Ib):



Claim 45 (previously presented): The method according to Claim 39, wherein $0 < x \leq 0.5$.

Claim 46 (previously presented): The method according to Claim 39, wherein $0 < y \leq 0.25$.

Claim 47 (previously presented): The method according to Claim 39, wherein $z < 1$.

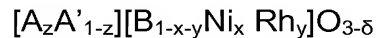
Claim 48 (currently amended): The method according to Claim 43, ~~further comprising about~~ wherein said perovskite crystallographic structure comprises
 $\text{La Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$.

Claim 49 (currently amended): The method according to Claim 44, ~~further comprising about~~ wherein said perovskite crystallographic structure comprises
 $\text{La}_{0.8} \text{Ce}_{0.2} \text{Fe}_{0.7} \text{Ni}_{0.25} \text{Rh}_{0.05} \text{O}_{3-\delta}$.

Claim 50-56 (cancelled)

Claim 57 (new) A method for the partial oxidation of light hydrocarbon mixtures, comprising:

providing a feed comprising said light hydrocarbon mixtures; and
contacting said feed with a catalyst comprising a perovskite crystallographic structure comprising formula (I):



wherein said A and said A' each comprise at least one component selected from the group consisting of the lanthanide family, the actinide family, and group IIa,

wherein said B is at least one component selected from the transition metal groups Ib, IIb, IIIb, IVb, Vb, VIb, VIIb, and VIIIb,

wherein $0 < x \leq 0.7$,

wherein $0 < y \leq 0.5$,

wherein $0 < x+y \leq 0.8$,

wherein $0 \leq z \leq 1$, and

wherein said δ is adjusted so as to obtain an electric neutrality of said perovskite compound.

Claim 58 (new): The method according to Claim 57, further comprising maintaining said catalyst at a temperature between about 500°C and about 1300°C.

Claim 59 (new): The method according to Claim 58, wherein said temperature is between about 600° and about 1100° C.

Claim 60 (new): The method according to Claim 57, wherein said method is carried out under a pressure between about 10^5 Pa and about 3×10^6 Pa.

Claim 61 (new): The method according to Claim 60, wherein said pressure is between about 10^5 Pa and about 10^6 Pa.

Claim 62 (new): The method according to Claim 57, wherein said feed further comprises an oxidant comprising at least one of:

- i) oxygen;
- ii) oxygen and an inert gas mixture; and
- iii) steam and carbon dioxide.